

NOTES ON THE LIFE HISTORY AND HABITS OF
THE BLUEBERRY STEM BORER, OBEREA
MYOPS HALD., ON CULTIVATED
BLUEBERRIES¹

BYRLEY F. DRIGGERS

ASSOCIATE ENTOMOLOGIST, NEW JERSEY AGRICULTURAL EXPERIMENT
STATIONS

While working on cranberry and blueberry problems at Whitesbog, N. J., from 1923 to 1927, the writer had an opportunity to take notes on the habits and life history of a coleopterous larva found boring in stems and branches of the cultivated blueberry. Diligent search failed to locate a specimen of the adult beetle in the field. It was not until the summer of 1927 that the writer was able to rear an adult from collected larval material and have it identified. Mr. W. S. Fisher, of the Bureau of Entomology, U. S. Department of Agriculture, identified the beetle as *Oberea myops* Hald. There has been little information published on the life history and habits of this species except when included as a variety under *O. tripunctata* Swed. For this reason the notes of the writer on the life history and habits of this species, although incomplete, are brought together at this time.

PREVIOUS HISTORY

The history of *Oberea myops* Hald. is not easily traced in the literature due to the fact that it has been included as one of several varieties of *O. tripunctata* Swed. Blatchley (1), in his description of *O. tripunctata* Swed., mentions *myops* as a color variety of this species. He mentions cottonwood and blackberry as hosts. Britton (2) records *O. tripunctata* var. *myops* Hald., as breeding in *Oxydendrum arboreum* and azalea in Connecticut. Jones (4) reports *O. tripunctata* Swed., as breeding in raspberry and blackberry canes in Wisconsin. Leonard (5), in a reference

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to *O. tripunctata*, says: "The varieties *myops* Hald., and *mandarina* Fab., are not differentiated in the records (Lg)." He lists the larva as feeding on plum, apple, quince, peach, elm and dogwood. Felt (3) provisionally identified injured azalea twigs sent in from Rochester, N. Y., as the work of the dogwood twig borer, *O. tripunctata* Swed. One borer, presumably the same, was also found in rhododendron. Weiss (6) records the dogwood twig girdler, *O. tripunctata* var. *myops* Hald., as having been collected at several localities in New Jersey. In a memorandum sent to the writer, Mr. W. S. Fisher, of the Bureau of Entomology, has this to say: "I found *myops* very abundant at Lyme, Conn., during 1918, and the larvæ were boring in the mountain laurel. In that locality it was a two year species." In recent correspondence with the writer Dr. Britton states that *myops* has been bred from azalea a number of times in and around New Haven, Conn.

NATURE OF INJURY ON BLUEBERRY

Two types of injury are produced by *Oberea myops* Hald., on blueberry. In late June and in July the first three or four inches of the current seasons growth may be found wilted or dead. Such an injury may be found on large, rapidly growing suckers or on smaller, slower growing twigs. If an injured twig is examined one will find the shoot or twig girdled in two places about one half inch apart. This type of injury is caused by the adult beetles when depositing eggs. Another type of injury that may be noted is the dying out of the canes. The leaves first turn from a green to a yellow or reddish color and drop off, followed by the dying out of the cane. Closer examination will show holes about the size of an ordinary pin head located at intervals of three or four inches along the shoot, and hanging from these, yellowish strings of castings may be found. A small pile of these castings is often found at the base of the cane. If the cane is split a cylindrical tunnel extending down the center of the cane, or just under the bark, is found. At the bottom of the tunnel a yellowish, legless grub from one half inch to an inch or more in length may be found. A small plant may be entirely killed by the tunneling of a larva. In this case the tunnels will be found

to extend up the several branches of the plant and down into the roots.

METHOD OF REARING AND LENGTH OF LIFE CYCLE

The method of rearing the larvæ was as follows: The twigs containing the larvæ were cut below the lowest point reached by the larvæ in tunneling. The end of the twig was then cleft grafted to a fresh twig and the two bound with muslin (Plate V, Figs. 1 and 2). No difficulty was experienced in getting the larvæ to bore from the old to the new twig. Figure 4 of Plate V shows an old twig from which a larva has tunneled. Figure 3 of the same plate shows the new twig split to show the new tunnel with the larva inside.

A number of larvæ was collected in the field in the summer of 1925. These larvæ were about one half inch in length, which indicated that they were at least one year old. These larvæ continued tunneling from one grafted stem to another throughout the latter part of the summer of 1925 and all of the summer of 1926. Out of the lot collected in the summer of 1925, four survived to, and pupated in, the spring of 1927. Of the four pupæ, one had emerged from the pupal skin inside the tunnel on May 23, 1927; another changed to an adult on June 3, 1927; a third had emerged and was boring out of the tunnel on June 19. The fourth pupa was lost.

A second lot of larvæ measuring from one half to three fourths of an inch in length was collected in the summer of 1926. The size of these larvæ at the time they were collected indicated that they were at least one, and possibly two, years old. Four of the larvæ, reared on grafted twigs, survived until the spring of 1927. Three of the larvæ changed to pupæ and emerged in May and June, 1927. The fourth larva continued boring actively up into June, at which time observations were discontinued.

Unfortunately, time and circumstances did not permit the writer to trace the life cycle of this insect from egg to adult in any one specimen. To that extent the life cycle is not complete. However, the rearing records for the larvæ collected in 1925 and 1926, together with their size when collected, indicate that this species requires three years to complete its life cycle in blueberry

under the conditions of rearing that were employed. Were the larvæ to remain undisturbed on the plant in the field throughout their life cycle, it may be possible for some of them to complete their life cycle in two years.

DESCRIPTION AND SEASONAL HISTORY

THE ADULT

The adults (Plate V, Figs. 7 and 8) are elongated, slender beetles averaging one-half inch in length. The under part of the body is yellow with black markings. The head is yellow, with the eyes and antennæ black or dark brown. The thorax is yellow with two small, round black spots on the disc. There are two additional black spots, one on each side of the thorax, situated at a point between and above the first and second pairs of legs. The elytra are grayish yellow, coarsely and deeply punctured, sometimes with a narrow, slightly dark stripe on the inner edge and a wider dark stripe on the outer edge. The yellow color of the beetle may vary from light to dark.

The adults are on the wing in June, July, and August. One beetle that was reared from larval material collected in the field was found to have shed its pupal skin by May 23 but had not begun to bore its way out. On June 19 three more beetles from reared material had shed their pupal skins and were boring their way out. Girdled twigs in which the eggs are deposited begin to appear in June and continue during July and early August. The peak of the egg laying season is the last week in June and the first week in July. The beetles apparently girdle twigs at night. Diligent search failed to find any beetles at work or on the wing in the day time.

THE EGGS

The yellowish, cylindrical and slightly curved eggs (Plate V, Fig 9) are 3 to 4 mm. long and about 0.5 mm. in diameter. The egg shell is tough but soft, allowing the egg to be flattened without apparent injury. Before depositing the egg, the adult makes two girdles, or rings of punctures, about one half inch apart and from three to six inches from the tip of the shoot.

The bark between the girdles is then slit lengthwise of the stem and the egg placed under one of the flaps of bark. That part of the twig above the two girdles immediately wilts and dies. When the dead tip becomes dry and brittle it usually, though not always, breaks off at the upper girdle. Growth of the section between the two girdles is arrested by the lower girdle. This section remains partly green for some time, usually until the egg hatches, after which the girdled tip dies (Plate V, tip of Fig. 5). No exact records on the time of incubation of the eggs was obtained. Field observations indicate that the incubation period is from ten days to two weeks.

THE LARVA

The newly hatched larva bores into the dead or dying half inch of stem between the two girdles. The larva continues boring to the tip of the twig and if that part of the twig beyond the upper girdle is intact may bore into it for a short distance. The larva then reverses itself and begins boring down the live part of the stem below the lower girdle. If a side twig is encountered (Plate V, short twig on left of Fig. 5) the larva may bore up this to the tip whereupon it reverses itself, plugs with castings the tunnel up the side twig, and continues down the main stem. At regular intervals tiny, circular orifices are bored to the outside of the stem through which the castings are ejected. When cold weather sets in the young larva plugs the tunnel with frass a short distance above the lowest point reached in tunneling. Another plug of frass is placed above this and the larva passes the winter between the two plugs, with its head pointed up the stem. The distance tunneled by the young larva after hatching and up to the time it constructs its winter "cell" varies from one or two to several inches, the distance tunneled depending on the time of hatching. The size of the young larvæ overwintering varies from one eighth to a little over one fourth of an inch (Plate V, Figs. 5 and 6).

Early the following spring the young larva starts tunneling down the stem. By the middle of the summer the yellow, legless but active larva has reached a length of one half inch or more. The distance a larva will tunnel by the end of the second sum-

mer was not determined. However, observations made on the activity of the larva in grafted twigs indicate that the larvæ reach the base of the bush by the end of the second summer. As the larva grows the circular openings it bores to the outside to dispose of castings increase in diameter (Plate V, Fig. 4, see arrow). Those larvæ reared in grafted twigs blocked off the tunnel with two plugs of frass when cold weather approached and passed the second winter upright in the cell thus formed.

The habits of the larvæ (based on observations made on larvæ one half inch long, collected in August, 1925, and which emerged as adults in June, 1927) during the third summer and winter are about the same as their habits the second summer and winter. At the end of the third summer the larvæ reach a length of one to one and a fourth inches (Plate V, Fig. 3). The following spring the larvæ remain in "cells" with heads pointing up the stem. In March the larvæ are to be found inactive with the body shortened and thickened.

THE PUPA

The shortened, thick and inactive larvæ changes to pupæ in April or May. In the mature pupæ the appendages of the adult that is to emerge may be plainly seen. When ready to emerge the adult works out of the pupal skin (Plate V, Fig. 7) and chews its way to the outside.

CONTROL

Only one parasitic enemy of *Oberca myops* Hald., was observed. This was a small hymenopterous parasite, the identity of which was not determined. Out of ten recently hatched larvæ collected the middle of July, 1925, five were found to be parasitized. This was the only time the writer reared parasites from any of the stages in the life cycle of the Blueberry Stem Borer.

A practical control for this insect, and one which is generally followed in cultivated plantings, consists in cutting out infested shoots at a point below the egg or larva. Such prunings may be left on the ground as the larvæ are unable to crawl back to the plant. In June, July and August the wilted or dry and brown dead twigs resulting from the egg laying of the beetles may be

readily seen. If the berry pickers are instructed to destroy all such wilted or dead twigs a considerable reduction in the number of larvæ will be made, and this at a time when the injury to the plant is negligible.

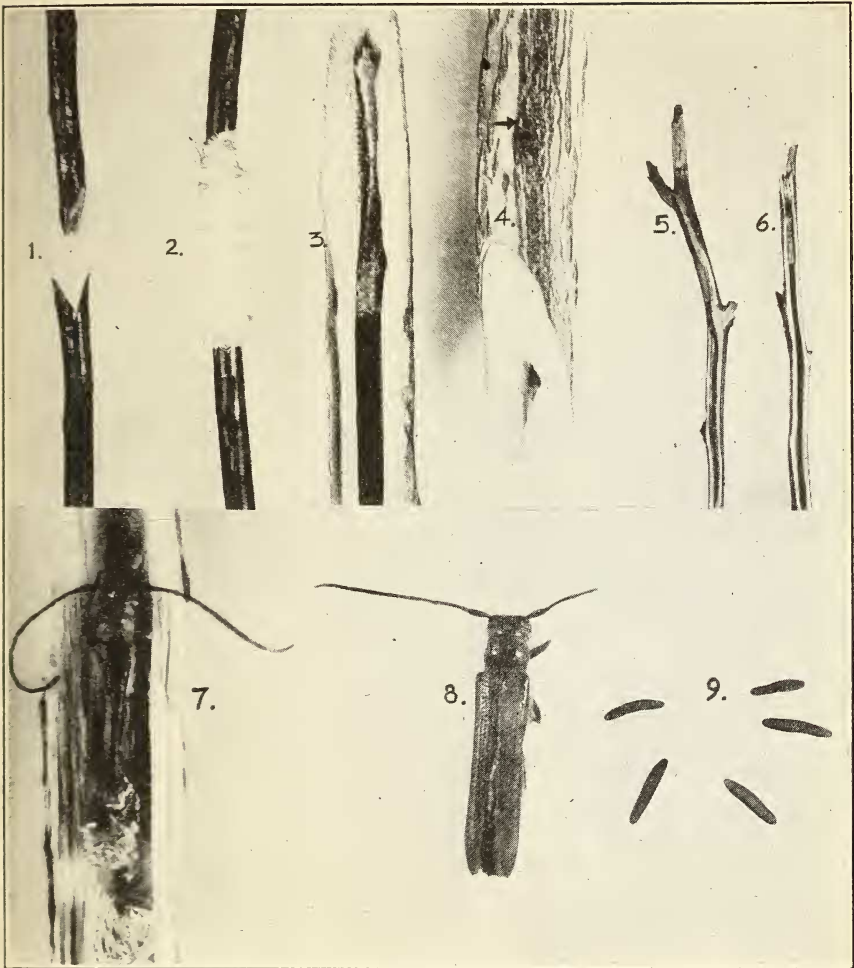
A number of larvæ that escaped destruction in the egg or young larval stage may be pruned out in the regular pruning season. Occasionally a shoot will be pruned out through which the larvæ has already passed to the crown of the plant. A piece of bailing wire worked down into such burrows will account for many of the larvæ. The control measures outlined should be carried out every year because new infestations may be expected from beetles bred in wild blueberry and other closely related plants.

LITERATURE CITED

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PLATE V

1. Method of grafting stem containing larva of Blueberry Stem Borer to new stem.
2. Completed graft bound with muslin.
3. New graft showing nearly mature larva in tunnel. About $1\frac{1}{4}$ \times natural length.
4. Old shoot from which larva has tunneled; arrow points to exit hole through which castings are ejected.
5. Twig with young larva in tunnel; light colored tip of stem shows section between girdles where egg was deposited. About natural size.
6. Twig with young larva in tunnel; note frass plug above larva. About natural size.
7. Adult emerging from pupal skin inside tunnel; note large plug of frass below beetle. About $3 \times$ natural length.
8. Adult beetle. About $3 \times$ natural length.
9. Eggs of the Blueberry Stem Borer. About $2 \times$ natural length.



OBEREA MYOPS